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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,642	01/15/2004	Wesley R. Bussman	31715-00057	5819

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EXAMINER

GRAVINI, STEPHEN MICHAEL

ART UNIT	PAPER NUMBER
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3749

DATE MAILED: 06/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/758,642

Applicant(s)

BUSSMAN ET AL.

Examiner

Stephen Gravini

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Lifshits (US 6,062,848). Lifshits is considered to disclose an improvement comprising:

an array (please see figure 2 for the claimed array configuration) of secondary fuel gas nozzles **44** located separate and remote from the radiant wall burners **12**, and means (please see means disclosed at column 11 line 65 through column 12 line 15) for introducing secondary fuel gas into the secondary fuel gas nozzles whereby the secondary fuel gas mixes with flue gases in the furnace and combusts with excess air, lowers the temperature of the burning fuel gas and reduces the formation of NO_x (please see column 3 lines 47-57 for the disclosed temperature lowering and NO_x reduction features). Lifshits is also considered to show the claimed adjacent, parallel, or opposite side positions with offset rows in figures 1 and 2.

Claims 15-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Knight (US 5,718,573). Knight is considered to disclose a method comprising:

providing a fuel lean mixture of fuel gas and air to individual radiant wall burners arranged in rows along a wall of the furnace (please see column 3 line 67 through column 4 line 10);

causing the mixture of fuel gas and air to flow radially outward from each radiant wall burner across the wall of the furnace whereby the mixture contains excess air and

is burned at a relatively low temperature and flue gases having low NO_x content are formed therefrom (please see column 3 lines 38-51 and column 4 lines 50-52); and

providing secondary fuel gas from secondary fuel gas nozzles located whereby the secondary fuel gas mixes with flue gases in the furnace and combusts with excess air from the radiant wall burners, lowers the temperature of the burning fuel gas and reduces the formation of NO_x (please see column 1 lines 8-63 wherein the disclosed flash back flame resistance inherently anticipates the claimed temperature lowering because both prevent ignition due to fuel flashpoint temperatures being exceeded to cause combustion). Knight is also considered to show the claimed adjacent, parallel, or opposite side positions with offset rows in figure 2.

Claim Rejections - 35 USC § 103

Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lifshits in view of Wang et al. (US 2003/0170579). Lifshits is considered to disclose the claimed invention, as discussed above under the anticipatory rejection, except for the claimed fuel angle eject opening and fuel angle nozzle tip delivery openings. Wang, another burner configuration, is considered to disclose fuel angle eject opening and fuel angle nozzle tip delivery openings at paragraph 33. It would have been obvious to one skilled in the art to combine the teachings of Lifshits with the fuel angle eject opening and fuel angle nozzle tip delivery openings, considered disclosed in Wang for the purpose of controlling various longitudinal and transverse heat flux profiles in order to allow lower temperature and NO_x reduction.

Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lifshits in view of Johnson (US 5,688,115). Lifshits is considered to disclose the claimed invention, as discussed above under the anticipatory rejection, except for the claimed furnace floor burners. Johnson, another burner configuration, is considered to disclose furnace floor burners at column 3 line 66 through column 4 line 9. It would have been obvious to one skilled in the art to combine the teachings of Lifshits with the furnace floor burners, considered disclosed in Johnson for the purpose of controlling the fuel trajectory in order to allow lower temperature and NO_x reduction.

Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight in view of Wang et al. (US 2003/0170579). Knight is considered to disclose the claimed invention, as discussed above under the anticipatory rejection, except for the claimed fuel angle eject opening and fuel angle nozzle tip delivery openings. Wang, another burner configuration, is considered to disclose fuel angle eject opening and fuel angle nozzle tip delivery openings at paragraph 33. It would have been obvious to one skilled in the art to combine the teachings of Knight with the fuel angle eject opening and fuel angle nozzle tip delivery openings, considered disclosed in Wang for the purpose of controlling various longitudinal and transverse heat flux profiles in order to allow lower temperature and NO_x reduction.

Claims 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Knight in view of Johnson (US 5,688,115). Knight is considered to disclose the claimed invention, as discussed above under the anticipatory rejection, except for the claimed furnace floor burners. Johnson, another burner configuration, is considered to disclose

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furnace floor burners at column 3 line 66 through column 4 line 9. It would have been obvious to one skilled in the art to combine the teachings of Knight with the furnace floor burners, considered disclosed in Johnson for the purpose of controlling the fuel trajectory in order to allow lower temperature and NOx reduction.

Response to Arguments

Applicant's arguments filed May 19, 2005 have been fully considered but they are not persuasive.

anticipation

Current Office practice permits claims to be construed under a broadest reasonable interpretation in light of the specification. Applicants acknowledge that primary reference Lifshits discloses secondary fuel gas ports located around the periphery of the air ports array. Also in that reference, it is noted that the burner **10** generally comprises a plate **12** (column 5 lines 22-23) and a secondary injection assembly includes a plurality of secondary fuel gas injection tubes **42** having nozzles **44**. Applicants argue the claimed "separate and remote [secondary fuel gas nozzles located] from an array of radiant wall burners" is patentably distinct from Lifshits. It can be seen in figures 2 and 5, that the secondary fuel gas nozzles **44** are located separate and remote from the radiant wall burners **12** because applicants' specification merely defines separate and remote as the secondary nozzles below or offset the radiant wall burners (specification paragraph 0026), for an intended use (specification paragraph 0031), and inserted through a wall at a distance (specification paragraph 0034). Each of these specification discussions is considered consistent with the anticipatory

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teachings of the primary reference. Applicants further argue that the independently claimed feature of "secondary fuel gas mixes with flue gases in the furnace and combusts with excess air" patentably distinguishes the claimed invention from primary reference Lifshits. By applicants own admission, Lifshits teaches that the secondary flue gas "at first entrains partially cooled products of combustion surrounding the flame and then mixes with the remaining combustion air and burns in a secondary combustion zone at column 3 lines 46-49. This further argument is considered to be inherently anticipated by Lifshits in that secondary flue gas mixing and excess air combustion, as claimed, is synonymous with the disclosed flue gas entrainment and remaining combustion air mixture because the disclosed entrainment is considered to anticipate the claimed mixing and the disclosed combustion air mixing is considered to anticipate the claimed excess air combustion. Applicant also argues that the primary purpose of Lifshits is flame stability rather than reduced NOx emissions, however since the claimed structure is the same as the disclosed teachings, so must the result of its use. The argued purpose is considered merely a statement of intended use which does not patentably distinguish the claimed invention of the prior art. Applicant finally argues that since claims 2-7 should not be rejected because of their dependency on claim 1, those claims should also be allowable. The rejections of claims 1-7 are considered proper and therefore maintained.

Applicants argue that second primary reference Knight does not anticipate the claimed invention because the disclosed method is completely contradictory from the claimed method. The Office broadly construes the argued method step (b) of "causing

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the mixture of fuel gas and air to flow radially outward from each radiant wall burner across the wall of the furnace whereby the mixture contains excess air and is burned at a relatively low temperature and flue gases having low NO_x content are formed therefrom" as being anticipated by the disclosed teachings in column 3 and 4 of Knight. Those teachings generally slow then speed up a combustion mixture where excess air is mixed (column 4 line 7 and lines 26-31) because the expressly disclosed combustion air supply for directing high temperature flame away to preclude thermal damage is considered to inherently anticipate the argued lowering temperature because lowering temperature, as claimed, will prevent thermal damage, as disclosed. Applicants further argue that the secondary fuel is mixed with a different substance in a different location to achieve a different purpose. It is considered that column 1 of Knight best discloses the argued feature. In that column, combustion air is premixed with fuel before burning in burners, particularly home heating units (column 1 lines 30-40). The disclosed burner home heating unit inherently anticipated the claimed furnace, because furnaces are known to be used as home heating units. Also, the argued lowering temperature feature and reducing NO_x formation is also inherent as discussed above, in response to applicants' argued step (b). Applicant finally argues that since claims 16-21 should not be rejected because of their dependency on claim 15, those claims should also be allowable. The rejections of claims 16-21 are considered proper and therefore maintained.

obviousness

Applicants argue that since the anticipatory rejections should not be maintained, the obviousness rejections in view of the primary anticipatory references, should be withdrawn. Secondary references Wang and Johnson are cited because it is considered that primary references Lifshits or Knight do not expressly disclose the claimed fuel angle eject opening and fuel angle nozzle tip delivery openings or the claimed furnace floor burners. It is not considered any of the references singly anticipate the claimed invention, but rather the secondary reference obviates the claimed invention as suggest above under the rejections. The obviousness rejections of claims 8-14 and 22-28 are considered proper and therefore maintained.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen Gravini whose telephone number is 571 272 4875. The examiner can normally be reached on normal weekday business hours (east coast time).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Monica S. Carter can be reached on 571 272 4475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SMG
June 23, 2005

Stephen Gravini